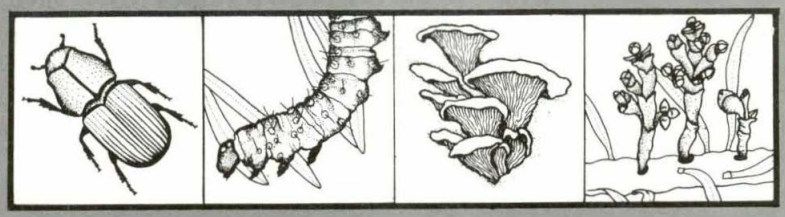
Forest Pest Management



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PERMANENT MOUNTAIN PINE BEETLE POPULATION TREND PLOTS: AN UPDATE, 1982

by

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ABSTRACT

The six areas in which permanent mountain pine beetle trend plots were established in 1979 were revisited in 1981 following beetle flight. Data obtained during 1981 indicated little change occurred in the infestations in five of those areas. For the second year no new attacks were observed in the Boulder Creek plots. Infestations remained static in the Dunsire Creek and Spotted Bear plots. The Murr Creek and Madison River plots showed slight decreases, while those in Centennial Valley exhibited a continuing decline.

INTRODUCTION

For the second year we monitored the six areas in which permanent mountain pine beetle population trend plots have been established. These plots, 30 in each area, were located where beetle populations appeared to be on the increase (Gibson, et al. 1980; Gibson 1981). While in some of these locations infestations are not building as rapidly as we had anticipated, we will continue to evaluate these plots yearly following beetle flight. We hope to obtain information regarding infestation development which will enable us to make better management recommendations for susceptible or infested lodgepole pine stands.

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DISCUSSION

The six permanent plot areas have been previously described (Gibson et al. 1980). They represent several of the current mountain pine beetle epidemics in lodgepole pine in western Montana. Plot identification and location are Centennial Valley, located on BLM land in Centennial Valley west of Red Rock Pass; Madison River, along West Fork Madison River west of Wade Lake, Madison RD, Beaverhead NF; Murr Creek, along Murr Creek and North Fork Murr Creek northeast of Bend Campground, Plains RD, Lolo NF; Boulder Creek, above Little North Fork Creek west of Lake Koocanusa, Rexford RD, Kootenai NF; Dunsire Creek near Sheppard Creek west of Star Meadows GS, Tally Lake RD, Flathead NF; and Spotted Bear, along South Fork Flathead River southeast of Spotted Bear RS, Spotted Bear RD, Flathead NF.

Data collected in 1981 indicated the infestation in Centennial Valley is continuing its decline. Attacked trees in 1981 averaged 5.5 per acre--compared to 8.9 per acre in 1980 (tables 1 and 2). To date, 89.8 trees per acre have been killed by the beetle. Approximately 207 unattacked lodgepole pine per acre over 5 inches d.b.h. remain, though most are smaller than 9 inches d.b.h. This infestation should continue to decrease in intensity over the next several years.

The infestation in the Madison River plots remained at about the same level in 1981. A slight decrease was noted--from 5.6 trees per acre in 1980 to 4.2 this year. More than 150 green trees per acre over 5 inches d.b.h. remain; however, as in the Centennial Valley plots, many of them are smaller than 9 inches d.b.h. We anticipate this infestation will continue at the same level in 1982.

The plots along Murr Creek and North Fork Murr Creek also showed a slight decrease in attacked trees in 1981. Where 9.6 trees per acre had been killed in 1980, average number killed in 1981 was 7.3 trees per acre. More than one-third of the 302 green trees per acre remaining are larger than 9 inches d.b.h. It is likely, therefore, that tree killing in 1982 will continue at near the present rate.

For the second consecutive year no new attacks were observed in 1981 in the Boulder Creek plots. While more than 267 green trees per acre over 5 inches d.b.h. remain, almost 80 percent of them are less than 9 inches d.b.h. If no new attacks are recorded in 1982, this area will probably not be revisited.

No new attacks occurred on the Dunsire Creek plots in 1981. Much of the stand, however, remains in larger diameter classes--47 percent over 9 inches d.b.h. Moderate stocking in these stands likely results in trees being in particularly vigorous condition. We will continue to monitor these plots closely in the next several years. In 1982 we plan to measure growth rates of some of the larger trees in this area to compare with growth rates of attacked trees in adjacent areas. Hard (1982) found that faster growing spruce trees appear to be resistant to spruce beetle attack irrespective of diameter in one area in Alaska. This might explain why the infestation has not developed as we anticipated it would.

Table 1.--Permanent mountain pine beetle trend plots in Montana--prior to beetle flight, 1981. Mountain pine beetle-caused mortality in lodgepole pine.

Area		1980 Attack	1979 Attack	1978 Attack	1977 Attack	Older dead	Total MPB dead	Other bark beetle mortality	Unknown mortality	Total standing dead	Percent MPB mortality
Centennial Valley	TA[1/]	8.9	47.8	13.5	9.9	4.2	84.3	28.4	3.0	115.7	73
	BFA[2/]	44.9	1057.7	446.4	549.8	114.8	2213.6	68.2	-	2281.8	97
Madison River	TA	5.6	8.8	14.9	4.2	3.8	37.3	38.4	9.3	85.0	44
	BFA	360.1	497.3	703.8	285.1	38.3	1884.6	86.9	-	1971.5	96
Murr Creek	TA	9.6	3.6	4.2	2.6	2.8	22.8	11.1	10.9	44.8	51
	BFA	112.3	45.9	88.0	47.2	113.2	406.6	-	142.3	548.9	74
Boulder Creek	TA	0.0	0.8	0.0	0.0	0.0	0.8	3.7	19.6	24.1	3
	BFA	0.0	-	0.0	0.0	0.0	-	-	48.5	48.5	0
Dunsire Creek	TA	0.5	0.0	0.6	0.0	0.0	1.1	2.6	32.5	36.2	3
	BFA	53.2	0.0	121.8	0.0	0.0	175.0	58.9	418.7	652.6	27
Spotted Bear	TA	0.7	0.0	1.0	0.3	1.1	3.1	5.9	38.3	47.3	8
	BFA	46.2	0.0	102.1	59.4	106.6	314.3	102.8	236.5	653.6	48

1/ Trees per acre

2/ Board foot volume per acre

Table 2.--Permanent mountain pine beetle trend plots in Montana--following beetle flight, 1981. Mountain pine beetle-caused mortality in lodgepole pine.

Area		1981 attack	1981 strip	1981 pitchout	Total MPB mortality (to date)	Other beetle mortality (1981)	Unknown mortality (1981)	Total standing dead (to date)	Percent MPB mortality	Remaining green LPP ≥5"
Centennial	TA	5.5	8.9	11.9	89.8	0.0	1.5	122.7	73	207.3
Valley	BFA	41.1	78.9	37.7	2254.7	0.0	-	2322.9	97	793.7
Madison	TA	4.2	9.5	4.8	41.5	0.0	5.2	44.4	93	156.9
River	BFA	361.2	157.7	165.6	2245.8	0.0	60.4	2393.1	94	1642.2
Murr	TA	7.3	0.0	4.1	30.1	0.0	1.3	53.4	56	302.4
Creek	BFA	267.7	0.0	200.1	674.3	0.0	7.9	824.5	82	4985.0
Boulder	TA	0.0	0.0	0.0	0.8	0.0	0.0	24.1	3	267.7
Creek	BFA	0.0	0.0	0.0	-	0.0	0.0	48.5	0	4351.4
Dunsire	TA	0.0	1.1	1.3	1.1	0.8	0.0	37.0	3	177.3
Creek	BFA	0.0	119.9	94.8	175.0	118.0	0.0	771.3	23	8161.6
Spotted	TA	1.2	0.0	0.0	4.3	0.0	0.0	48.5	9	232.0
Bear	BFA	-	0.0	0.0	314.3	0.0	0.0	653.6	48	7866.8

At Spotted Bear a very slight increase in attacked trees was observed in 1981. This area, like Dunsire Creek, contains a high number of susceptible lodgepole pine. And, also like Dunsire Creek, we anticipated the beetle infestation would develop more rapidly. It may be that stocking (BA = 122 ft^2/acre) and growth rates, or age, may be responsible for low beetle populations.

CONCLUSION

This is the second year these plots have been monitored since their establishment in 1979. Back-dating infested trees has enabled us to accumulate mortality data from 1977. This gives us a 5-year record of beetle activity in those areas. We hope to maintain these plots for the next several years. The data accumulated at the end of that time should add significantly to our knowledge of mountain pine beetle effects through the course of an infestation.

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